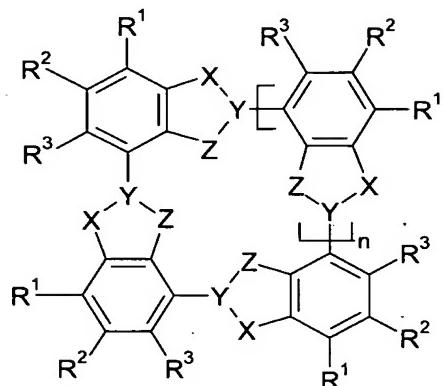


We claim:-

5 1. The use of cyclic compounds of the formula (I)



10 where

n is a number in the range from 1 to 7,

15 X-Y-Z, in each case independently of one another, is O-C=N, N=C-O, NR⁵-C=N, N=C-NR⁵, N⁺R⁵₂-C=N, N=C-N⁺R⁵₂, O-C=N⁺R⁵, N⁺R⁵=C-O, S-C=N⁺R⁵, N⁺R⁵=C-S, S-C=N, N=C-S,

20 R¹, R² and R³, in each case independently of one another, are H or a substituent from the group consisting of C₁₋₁₂-alkyl, C₁₋₁₂-alkanoyl, C₃₋₇-cycloalkyl, C₆₋₁₂-aryl, C₇₋₁₃-aralkyl, C₇₋₁₃-alkaryl, C₁₋₁₂-alkoxy, C₆₋₁₂-aryloxy, C₁₋₁₂-hydroxyalkyl, a heterocycle, C₆₋₁₂-aroyl, each of which may be substituted, hydroxyl, thiol, halogen, cyano, isocyano, nitro, ammonium, amino, phosphine, phosphine oxide, a sulfonic acid or a derivative thereof, carboxylic acid or a derivative thereof, a derivative of silicon, C₂₋₁₂-alkynyl or C₂₋₁₂-alkenyl, it being possible for the double or triple bonds to be linked directly to the cycloquater skeleton or to be in the chain, a carbamate of the formula -NH-CO-OR⁷, a substituted urea of the formula -NR⁷-CO-NR⁷₂, an alkyl carbonate substituent of the formula -O-CO-OR⁷, a sulfinic acid of the formula -SO-OR⁷ or a derivative thereof, a sulfoxide of

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the formula -SO-R⁷ or a derivative thereof, phosphonic acid or a salt, ester or amide thereof,

5 it also being possible for R¹ and R² and/or R² and R³, in each case independently of one another, to form unsubstituted or substituted fused ring systems comprising from 1 to 3 rings, which may contain hetero atom groups, or to form unsubstituted or substituted alkylene groups which may be interrupted by hetero atom groups, it also being possible for the fused compounds to be substituted as stated above for the radicals R¹, R² and R³,

10 it being possible for oxygen atoms in radicals carrying oxygen atoms also to be replaced by sulfur atoms,

15 it being possible for on average from 0.05 to 100% of the radicals R¹, R² and R³ present in the molecule to differ from hydrogen,

20 or corresponding heterocyclic compounds in which at least one group -CR¹=, -CR²=, -CR³-CR³= is replaced by -N=,

R⁵,
25 in each case independently of one another, are H, unsubstituted or substituted C₁₋₁₂-alkyl, C₆₋₁₂-aryl, C₇₋₁₃-alkylaryl, unsubstituted or substituted C₁₋₁₂-alkanoyl, unsubstituted or substituted C₇₋₁₃-aryloyl, oligoethylene glycol having 1 to 6 oxygen atoms, oligoethylene glycol ether having 1 to 6 oxygen atoms, imidazoylmethyl or a corresponding radical in which a nitrogen atom is substituted by a C₁₋₁₂-alkyl radical and may carry a positive charge and a C-H group in the ring may be replaced by C-(C₁₋₁₂-alkyl), or (1-C₄₋₆-lactam)methyl, which may be C₁₋₁₂-alkyl-substituted on the ring,

30 R⁷,
35 in each case independently of one another, are H, C₁₋₁₂-alkyl or C₆₋₁₂-aryl,

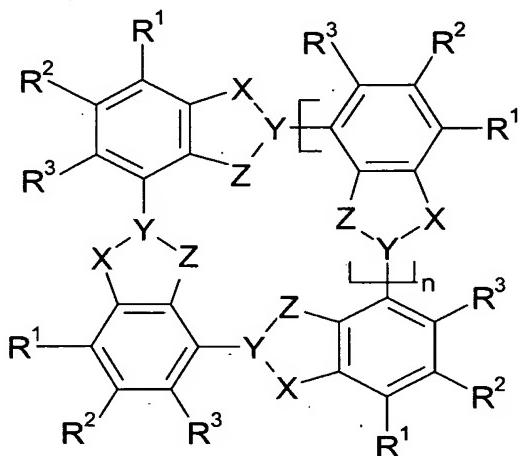
and tautomeric structures thereof

or metal complexes of the cyclic compounds or complexes of the cyclic compounds with mineral acids,

chloride, sulfate, bisulfate, phosphate, hydrogen phosphate, nitrate, BF_4^- or methanesulfonate being present as opposite ions X^- in the case of cationic cyclic structures,

5 as light absorbers, materials for hole injection layers in OLEDs, light-emitting compounds in OLED, phase-transfer catalysts and synergistic agents for the dispersing of pigments or for optical data storage.

10 2. The use as claimed in claim 1, wherein a cyclic compound of the formula (I)



(I)

where

15 n is an integer in the range from 1 to 7,

X-Y-Z, in each case independently of one another, is O-C=N, N=C-O, NH-C=N, N=C-NH, S-C=N or N=C-S,

20 R^1 , R^2 and R^3 , in each case independently of one another, are H or a substituent from the group consisting of C_{1-12} -alkyl, C_{1-12} -alkanoyl, C_{3-7} -cycloalkyl, C_{6-12} -aryl, C_{7-13} -aralkyl, C_{7-13} -alkaryl, C_{1-12} -alkoxy, C_{6-12} -aryloxy, C_{1-12} -hydroxyalkyl, a heterocycle, C_{6-12} -aroyl, each of which may be substituted, hydroxyl, thiol, halogen, cyano, isocyano, nitro, ammonium, amino, phosphine, phosphine oxide, a sulfonic acid or a derivative thereof, a carboxylic acid or a derivative thereof or a derivative of silicon,

25

5

it also being possible for R¹ and R² and/or R² and R³, in each case independently of one another, to form unsubstituted or substituted fused ring systems comprising from 1 to 3 rings, which may contain hetero atom groups, or to form unsubstituted or substituted alkylene groups which may be interrupted by hetero atom groups,

10

it being possible on average for from 0.01 to 12 of the radicals R¹, R² and R³ present in the molecule to differ from hydrogen,

15

or corresponding heterocyclic compounds in which at least one group -CR¹=, -CR²= or -CR³ is replaced by -N=,

or metal complexes of the cyclic compounds,

20

as light absorbers, materials for hole injection layers in organic light-emitting diodes (OLED) or phase-transfer catalysts

25

or as synergistic agents for the dispersing of pigments,

is used.

30

3. The use of a metal complex of the compound of the formula (I), as defined in claim 1 or 2, as an oxidation catalyst.

35

4. The use as claimed in claim 1 or 2, wherein the light absorber is a UV absorber and/or Vis absorber.

40

5. The use as claimed in any of claims 1 to 4, wherein the cyclic compound of the formula (I) is used in soluble, partly soluble or insoluble form in an application medium, it also being possible for solid solutions with other colorants to be present in the insoluble form.

45

6. The use as claimed in any of claims 1 to 5, wherein R¹, R², R³ have the same meanings for all positions.

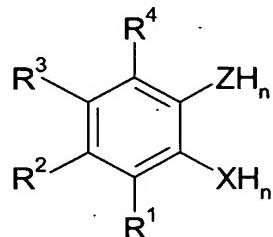
50

7. A cyclic compound or a metal complex of the cyclic compounds or a complex of the cyclic compounds with a mineral acid, as defined in claim 1 or 2, with the exception of cyclic compounds where

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X-Y-Z is N=C-O, NH-C=N or N=C-NH,
 R^1 , R^2 and R^3 are H or C₁₋₆-alkyl.

8. A process for the preparation of a cyclic compound of the formula (I) as claimed in
 5 claim 7 by cyclization of a compound of the formula (II)



(II)

10 where

R^1 , R^2 , R^3 , X and Z are as stated,

15 R^4 is -COOH or a derivative thereof and

n in each case is 1 or 2, to obtain give the stoichiometry,

20 it also being possible for OH groups to be present as in alkali metal salt or ammonium salt groups and/or for NH₂ groups to be present in protonated form or derivative form as -NO, -NO₂, -N=N-aryl, =NOH, =NH, and it being possible for the cyclization to be carried out in the presence of metal salts, metal powders or Lewis acids as templates and in the presence of condensing agents or under dehydrating conditions.

25 9. A process for the preparation of a complex of a cyclic compound by the preparation of the cyclic compound by a process as claimed in claim 8 in the presence of metal salts or metal powders as templates or by reaction of a cyclic compound as claimed in claim 7 with a metal salt or metal powder.

30 10. The use as claimed in any of claims 1 to 6 as a light absorber for coloring high molecular weight organic materials.

11. A thermoplastic molding material, finish or coating composition comprising a light

absorber as defined in any of claims 1 to 6.

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